*Pacific Heating & Cooling Technology Ltd*

Location: 9/28 Torrens Road Burswood, Auckland 2013
Phone: 09-2652626 Fax: 09-2652525
Website: www.pacifichac.nz

# SWIMMING POOL HEATER PLASTIC SHELL

## Directions for installation and maintenance

**Model: KS120 / KS150 / KS200 / KS250**

RoHS

**-Please read this operating manual before using the Heat Pump -**

# *Summary*

1. Introduction .....*p3*

2. Caution .....*p3*

3. Delivery control .....*p4*

4. Technical description ..... *p4*

- Technical characteristics
- General diagram of the refrigerating circuit
- Exploded Views
- Safety and control systems
- Electric diagram

5. Installation..... *p10*

- Rules of installation
- Hydraulic connections
- Electric connections
- Description of the order and display panel
- Procedure of use
- Adjustment of operation timetable(timer)
- Setting

6. Water flow and refrigerating circuit pressure.....*p18*

7. Defrosting .....*p18*

8. Environment problem .....*p19*

9. Regular operations of maintenance ..... *p19*

10. Error messages and what to do..... *p20*

11. Problems / solutions ..... *p21*

12. Further recommendations ..... *p22*

# *1- Introduction*

Thank you for choosing our heat pump.

This installation and maintenance notice contains the necessary information to its installation (delivery control, the installation, the connections) and to its repair. It is a complementary document to the user's manual which describes its instructions for use.
We invite you to read it first.

# *2-* Caution

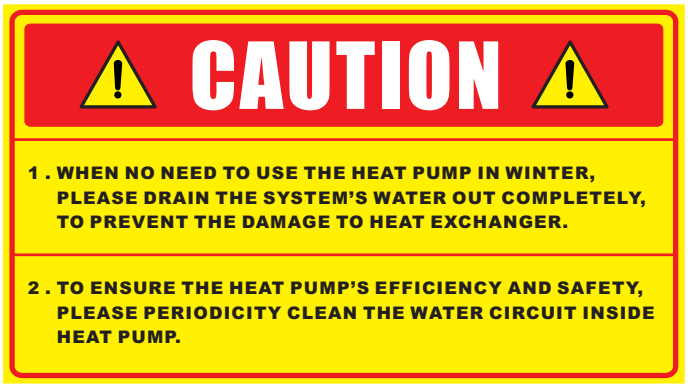
This document is an integral part of the product and it must stays in the technical room.

This Heat pump is exclusively for heating swimming pools.
Any other use not in conformity and random will be considered as dangerous and unsuitable.

The assembly, the electric connection and the start up must be carried out by specialized and professional person.

It is essential to maintain the temperature in the swimming pool lower than the recommended value by the swimming pool's manufacturer.

In a concern to a constant improvement, our products can be modified without notice; the present pictures in this note or the characteristics which are described are not contractual.


CAUTION
1 . WHEN NO NEED TO USE THE HEAT PUMP IN WINTER, PLEASE DRAIN THE SYSTEM'S WATER OUT COMPLETELY, TO PREVENT THE DAMAGE TO HEAT EXCHANGER.
2 . TO ENSURE THE HEAT PUMP'S EFFICIENCY AND SAFETY, PLEASE PERIODICITY CLEAN THE WATER CIRCUIT INSIDE HEAT PUMP.

# 3- Delivery's control

At the delivery time, check the condition of packing; in case of damages, have reservation about them to the carrier, before 48 hours and by registered letter with acknowledged receipt.

Before any manipulation, check the complete state of the machine.

# 4- Technical description

| Model | | **KS120** | **KS150** | **KS200** | **KS250** |
|---|---|---|---|---|---|
| Air discharge | | Vertical | Vertical | Vertical | Vertical |
| Shell material | | Plastic | Plastic | Plastic | Plastic |
| Heating capacity | KW | 12.0 | 14.5 | 19.5 | 24.3 |
| Rated power in | KW | 2.76 | 3.18 | 4.52 | 5.78 |
| COP | | 4.35 | 4.5 | 4.3 | 4.2 |
| Noise | dB(A) | 49 | 50 | 55 | 55 |
| Power supply | V/Ph/Hz | 230/1/50 | 230/1/50 | 400/3/50 | 400/3/50 |
| Rated current in | A | 13.2 | 14.3 | 8.0 | 8.8 |
| Max current in | A | 15 | 16.1 | 9.46 | 11.1 |
| Temperature | ℃ | 5-40 | 5-40 | 5-40 | 5-40 |
| Compressor | Type | Rotary | Scorll | Scroll | Scroll |
| Refrigerant R410a | g | 1850 | 2450 | 2800 | 3000 |
| Manometer | | Yes | Yes | Yes | Yes |
| Fan quantity | | 1 | 1 | 1 | 1 |
| Min water fiow | L/min | 90 | 100 | 130 | 130 |
| Water connect | Inch | 2 | 2 | 2 | 2 |
| Heat exchanger | | Titanium PVC | Titanium PVC | Titanium PVC | Titanium PVC |
| Flow switch | | Yes | Yes | Yes | Yes |
| Pressure protect | | HP and LP | HP and LP | HP and LP | HP and LP |
| Display | | LED | LED | LED | LED |
| Auto-defrost | | Yes | Yes | Yes | Yes |
| Microcomputer control | | Yes | Yes | Yes | Yes |
| Wire control | | Option | Option | Option | Option |
| Packing method | | Wood | Wood | Wood | Wood |
| Unit dimension | LXWXH(mm) | 670/610/958 | 670/610/958 | 793/725/980 | 793/725/980 |
| Packing dimension | LXWXH(mm) | 740/670/1090 | 740/670/1090 | 840/755/1105 | 840/755/1105 |
| Net/shipping weight | Kg | 75/97 | 82/104 | 100/130 | 109/130 |
| Loading quantity(40HQ) | Sets | 96 | 96 | 84 | 84 |
| Model for heating only | | KS120N | KS150N | KS200N | KS250N |

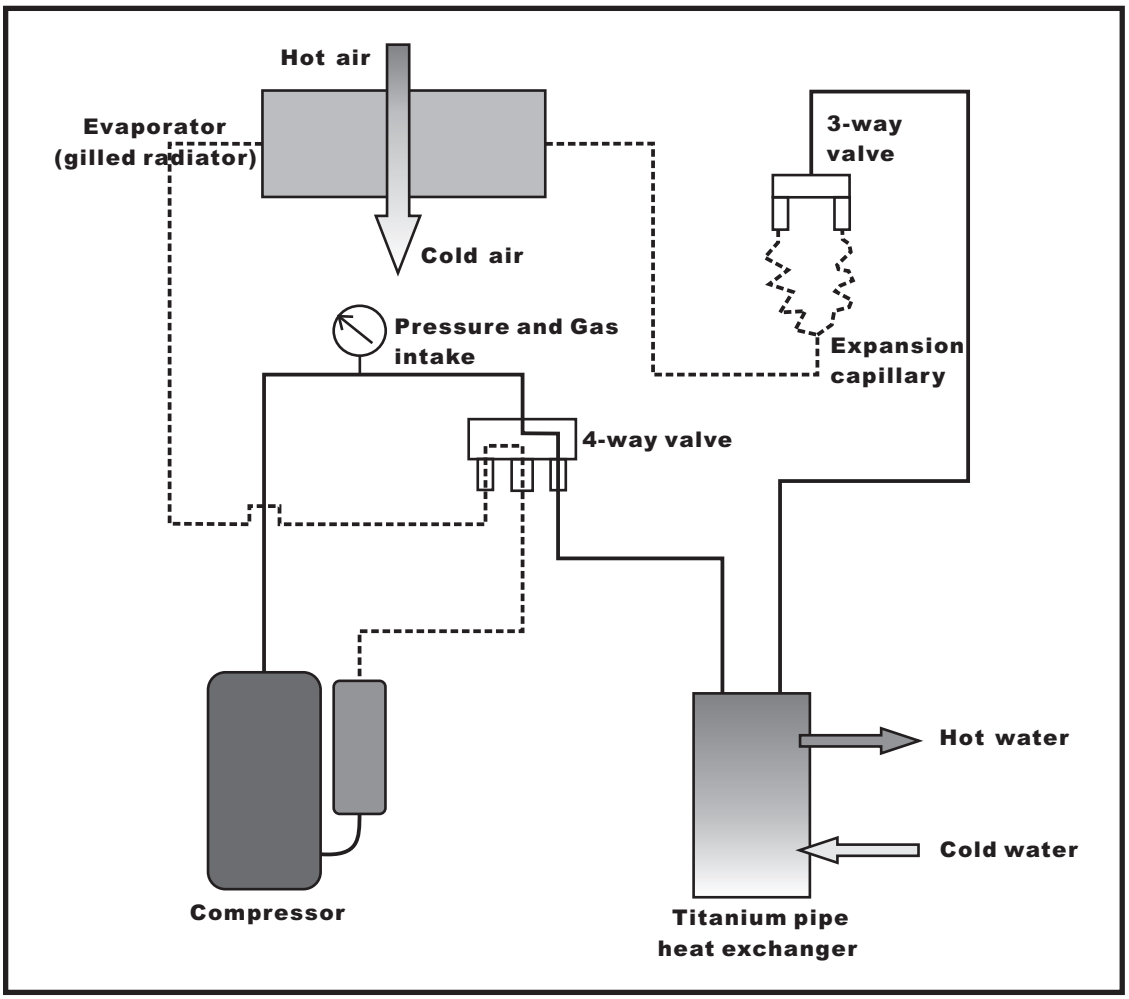
Heating capacity is based on inlet water temperature 25℃, Ambient air temperature 24℃(DB)/19℃(WB)

# General diagram of the refrigerating circuit

The heat pump is reversible allowing the swimming-pool's heating or cooling:

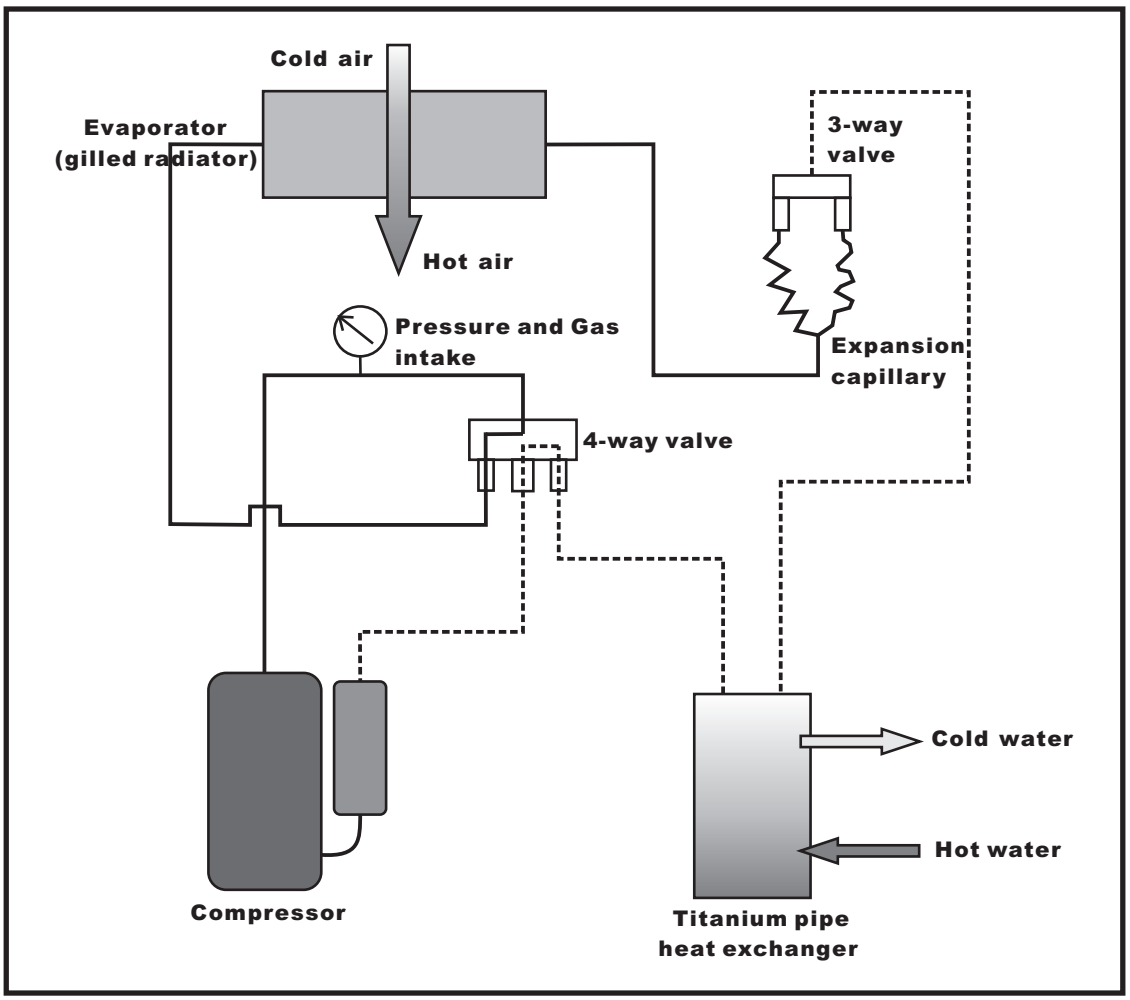
## Swimming-pool water's heating mode:

The cold and liquid refrigerant fluid absorbs the heat contained in the air through the evaporator (gilled radiator), in which it is vaporizing; it is then put up in pressure and in temperature by the compressor which sends it in the condenser (exchanger) where it loses its heat (in giving it to the water of swimming pool) and comes back in liquid state; it loses its pressure and still cools in the expansion capillaries before turning back to the evaporator for a new cycle.

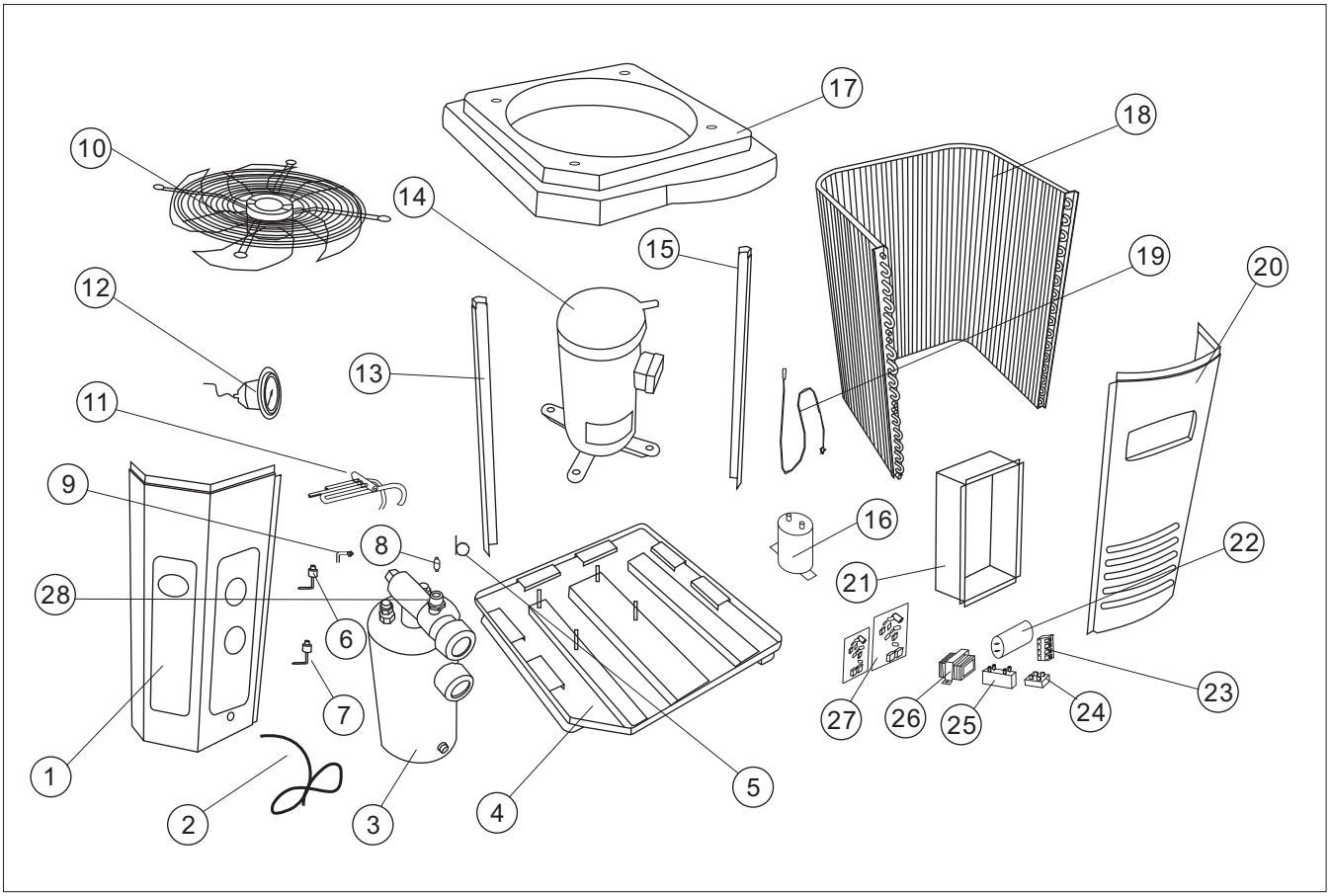


## Swimming-pool water's cooling mode: *

The 4 way valve reverses the circulation of the refrigerant fluid; the fluid vaporizes in the exchanger (evaporator) in getting the heat of the water, goes through in the compressor which reheats it and through in the gilled radiator (which becomes condenser) where it comes back to liquid state.



# Exploded Views




| | | | |
|---|---|---|---|
| 14 | Compressor | 28 | Flow detector |
| 13 | Left Pillar | 27 | Circuit Board |
| 12 | Manometer | 26 | Transformer |
| 11 | Four Way Valve /Copper Pipe | 25 | Motor Capacitor |
| 10 | Fan motor | 24 | Public Terminal |
| 9 | Filling gas valve | 23 | Terminal |
| 8 | Filter | 22 | Compressor Capacitor |
| 7 | High Pressure switche | 21 | Electrical Box |
| 6 | Low Pressure switche | 20 | Right Front Panel |
| 5 | Capillary | 19 | Defrost Sensor |
| 4 | Chassis | 18 | Condenser |
| 3 | Titanium and PVC Heat Exchanger | 17 | Top cover |
| 2 | Power Cord | 16 | Liqid reservoir |
| 1 | Left Front Panel | 15 | Right Pillar |

# Safety and control systems

The heat pump is fitted out:

With 2 control systems :

- A temperature sensor of the evaporator, starting the defrosting operation.
- A temperature sensor placed on the exchanger, ensuring the cut of the heat pump when the temperature of the water reaches the required temperature. The normal cycle restarts when the temperature in the exchanger goes down to a temperature lower of 2°C than this required.

With 4 safety systems:

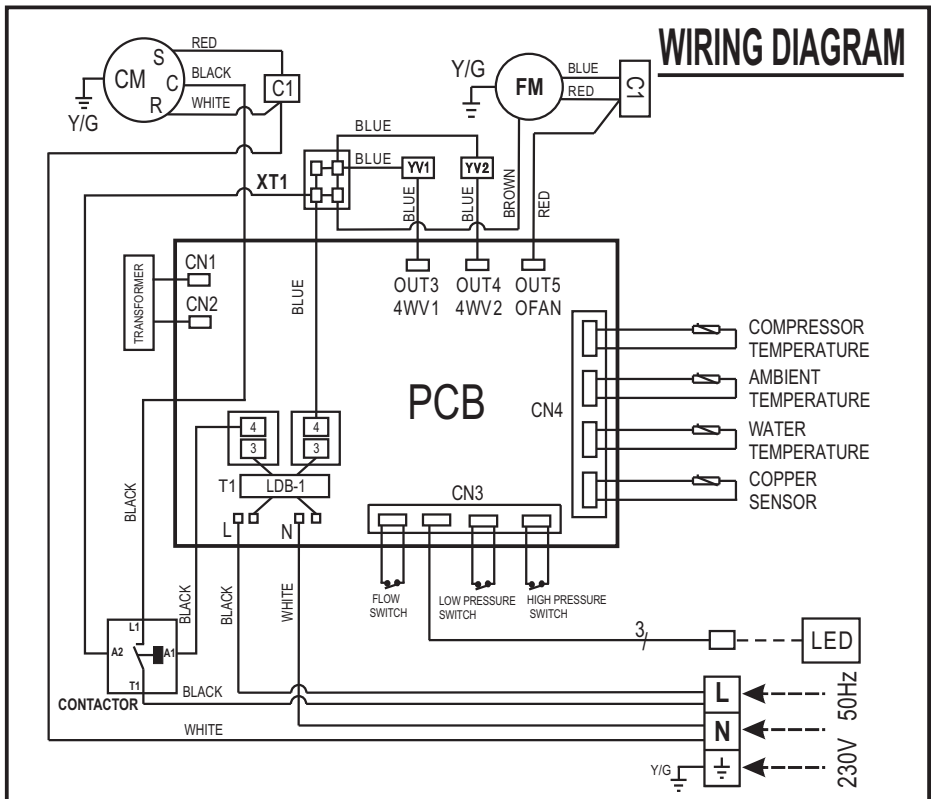
- A water flow detector placed at the entry of the exchanger
- A high pressure gas circuit breaker, a low pressure gas circuit breaker
- An outlet compressor temperature sensor
- Integrated to the card, a magnetic ammeter/circuit breaker on the compressor.

If a defect occurs on one of these systems (defective system, off-line or abnormal measured value) a message of defect appears on the display screen; see the paragraph “Error codes and what to do” of this note.

**Caution**: the removal or the shunt of one of the control or safety systems involves the cancellation of the guarantee.

## *Electric diagram*

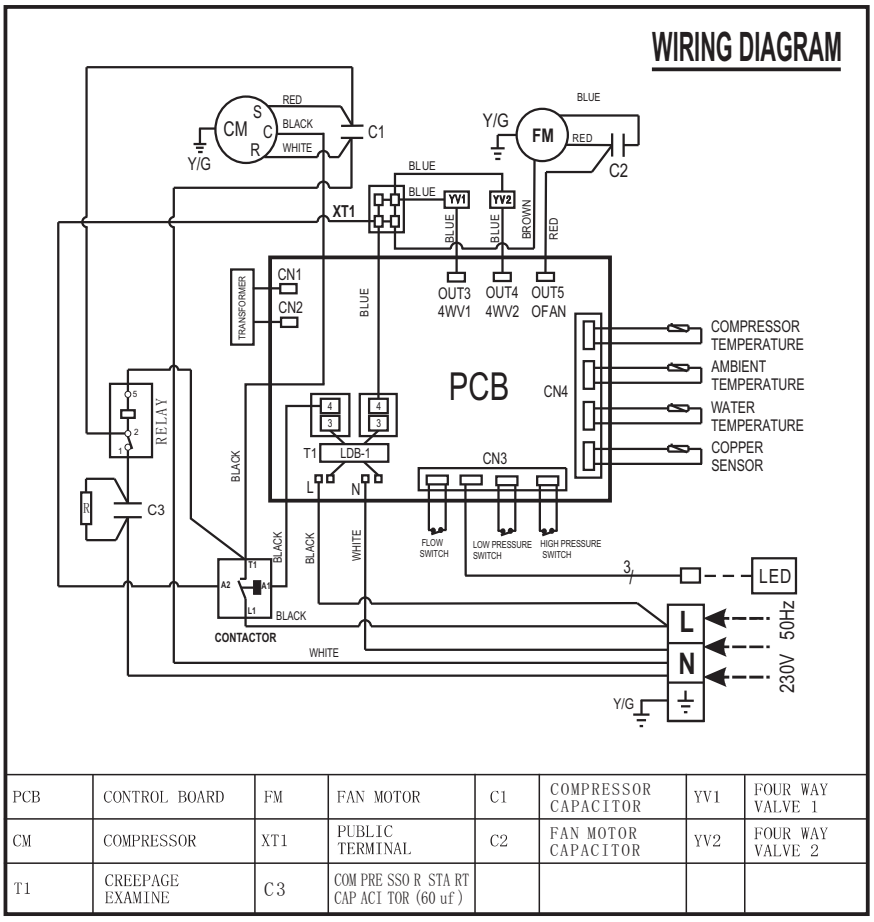
KS120




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PCB | CONTROL BOARD | FM | FAN MOTOR | C1 | COMPRESSOR CAPACITOR | YV1 | FOUR WAY VALVE 1 |
| CM | COMPRESSOR | XT1 | PUBLIC TERMINAL | C2 | FAN MOTOR CAPACITOR | YV2 | FOUR WAY VALVE 2 |
| T1 | CREEPAGE EXAMINE | | | | | | |

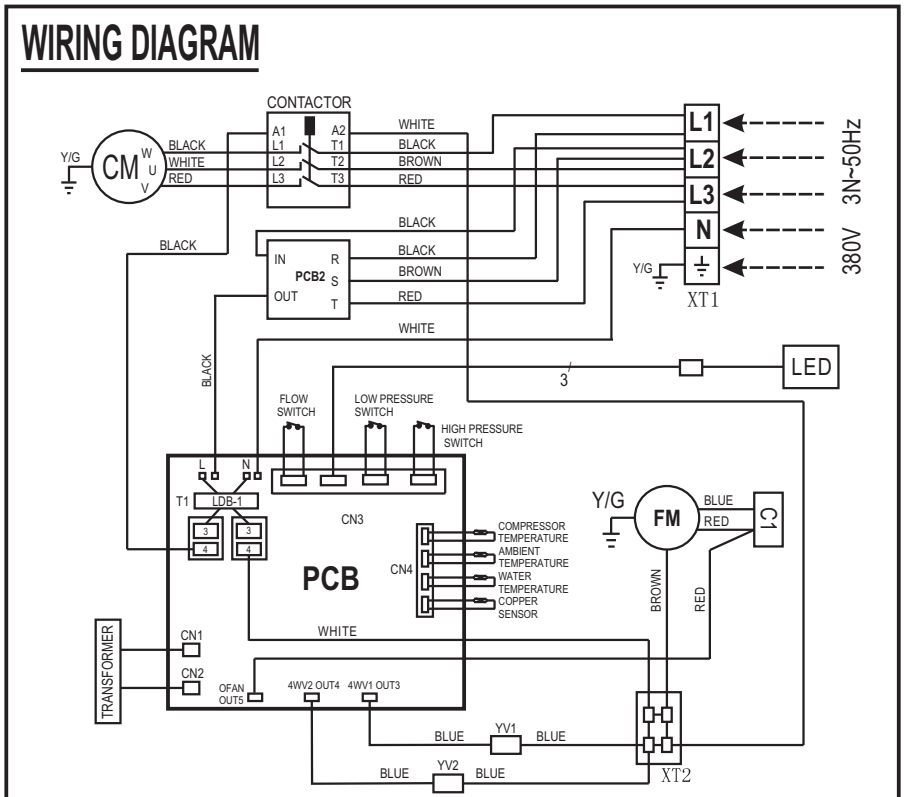
# *Electric diagram*

KS150




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PCB | CONTROL BOARD | FM | FAN MOTOR | C1 | COMPRESSOR CAPACITOR | YV1 | FOUR WAY VALVE 1 |
| CM | COMPRESSOR | XT1 | PUBLIC TERMINAL | C2 | FAN MOTOR CAPACITOR | YV2 | FOUR WAY VALVE 2 |
| T1 | CREEPAGE EXAMINE | C3 | COMPRESSOR START CAPACITOR (60uf) | | | | |

KS200 / KS250




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PCB | CONTROL BOARD | FM | FAN MOTOR | C1 | FAN MOTOR CAPACITOR | YV1 | FOUR WAY VALVE 1 |
| CM | COMPRESSOR | T1 | CREEPAGE EXAMINE | XT1 | POWER TERMINAL | YV2 | FOUR WAY VALVE 2 |
| XT2 | PUBLIC TERMINAL | | | | | | |

# 5- Installation

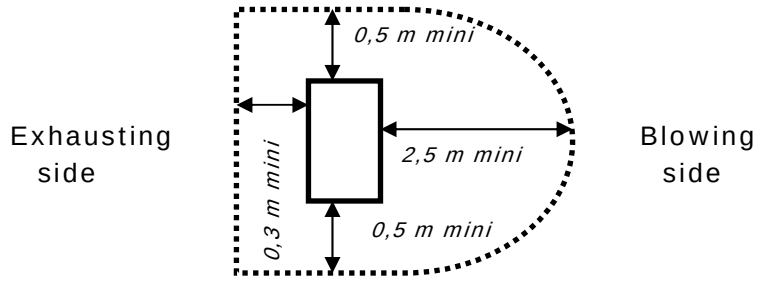
## Rules of installation:

Electric and hydraulic connections must be carried out according to standards in effect (NF C 15 100, CE I 364).

The machine must be installed outside.

The machine must be posed on its antivibratory studs, set and lying flat and on a massive base (concrete slab); this base must have a sufficient height to prevent any entry of water by the bottom of the machine. Height must be adjusted to fit the connector collecting the condensates.

The obstacles such as wall and vegetation must be separated from the machine as indicated on the diagram below.




Do not to install the Heat pump in a confined place (the fan would recycle its air and the Heat pump would be down performance).

The fan should not blow towards the windows or crossing point.

Safety distance between the swimming pool and the foot bath: the fitter must imperatively refer to the standard C15-100 section 702; the machine should not be installed in volume 1 surrounding the swimming pool but at least in volume 2 so at a distance of 3 m minimum of the swimming pool and foot bath.

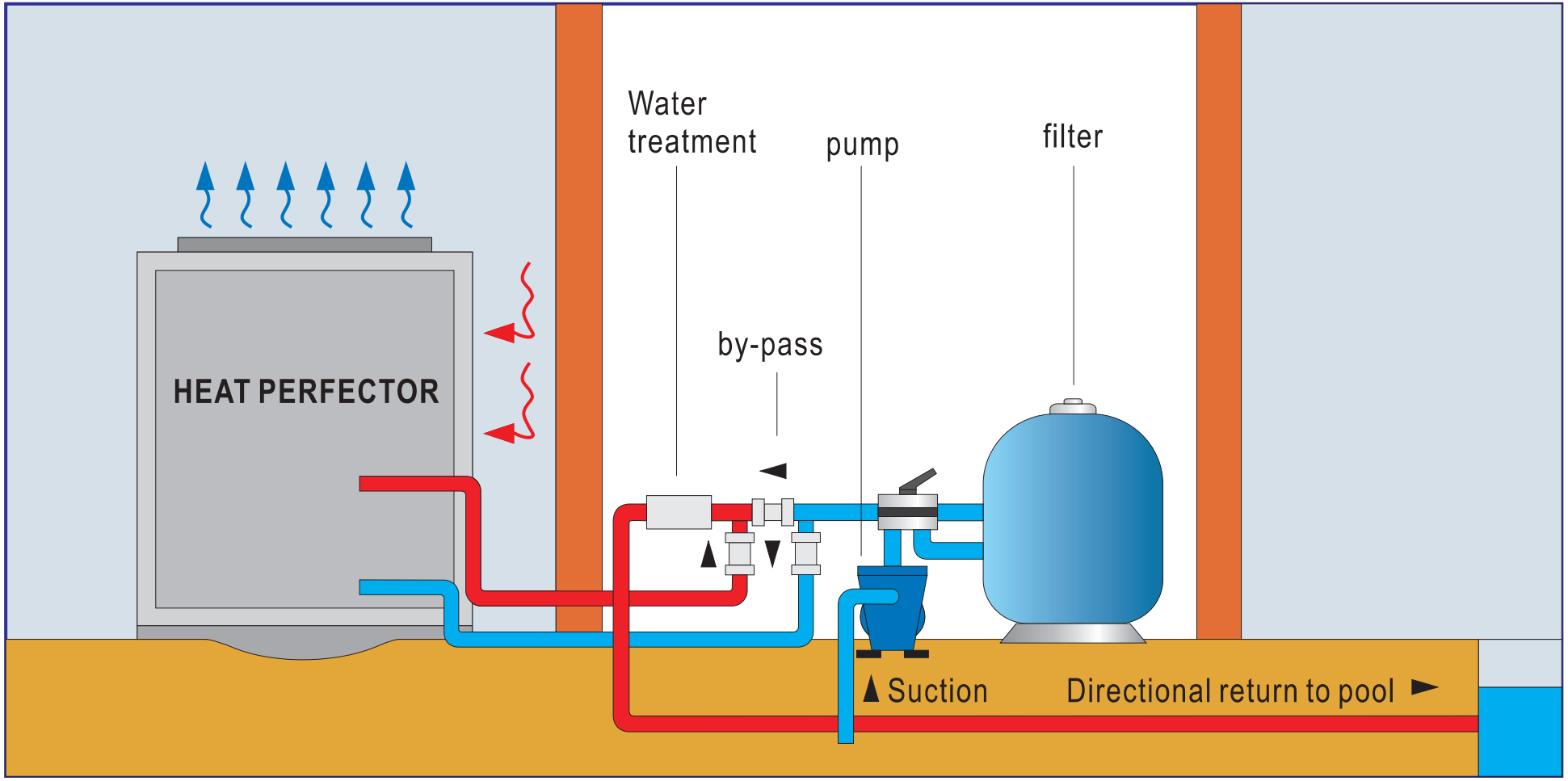
Other precautions of installation:

- Do not to install the machine near a way with circulation of car in order to avoid mud projections.
- Avoid directing blowing against dominant winds.
- If the machine is intended to be used in winter, put it in a place protected from the falls of snow.
- The machine must be able to be supervised in order that children do not play around

# Hydraulic connections:

To respect imperatively
Connection is carried out with a by-pass located on the circuit of filtration, upstream appliances of the chemical treatment of water.

Connect intake/outlet water PVC pipes DN50 to the openings of the machine in following the inlet / outlet indications (grease the worms before screwing)



## Electric connections:

**CAUTION: before connecting the machine, make sure that the feeder is disconnected to the electrical network.**

The electric installation must be carried out by an experienced electrician and the supply must come from a severing equipment and differential protection; the whole must be carried out according to standards' in force in the country where the material is installed.

Characteristics of the electric supply:
- For KS120 and KS150: 230V +/- 10%, single-phase current, 50Hz,
- For KS200 and KS250: 400V +/- 10%, triple-phase current, 50Hz,
- Mode of neutral TT and TN.S; the circuit of heat pump must be connected to an earth circuit.

Characteristic minimum of the protection:
- Protection must be of 16A, by circuit breaker or fuse; it must protect the Heat pump exclusively; the circuit breaker must be specified with curve D, the fuse must be specified Am.
- Differential protection : 30mA (the length of cable between the connector block of the heat pump and the protection of should not exceed 12m).

Control :

The heat pump is fitted out with a flow detector which function is to apply the voltage to the electronic card when the water flow is sufficient.

We recommend when it is possible to control the heat pump to the filtration pump (by contacting relay non supplied to insert in the feeding circuit of the heat pump).

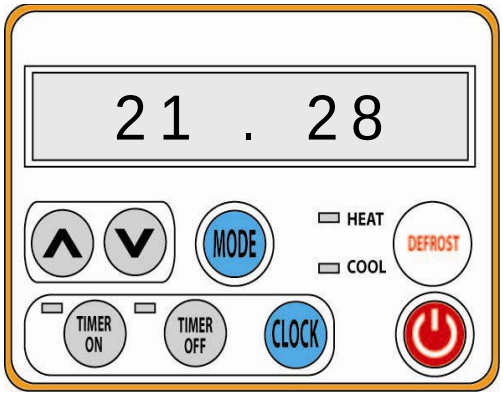
Removed control panel:

An extension cord allows the removal of the panel in inserting it in a standard electric box into the technical local; the option is supplied with a cover allowing to seal the aperture let by the removal of the control panel.

**POWER SUPPLY PHASE PROTECTION**

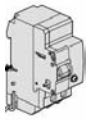
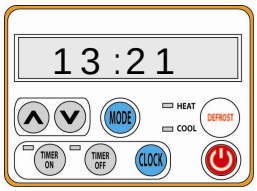
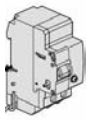
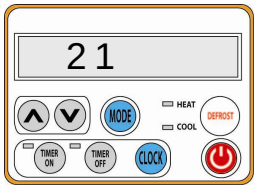
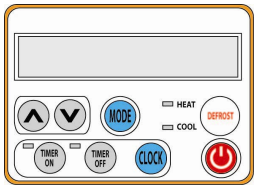
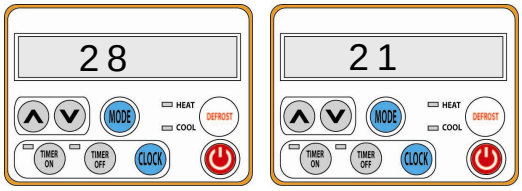
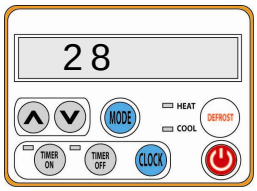
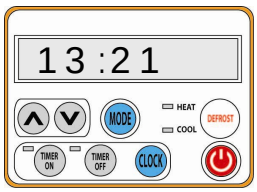
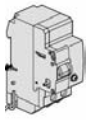
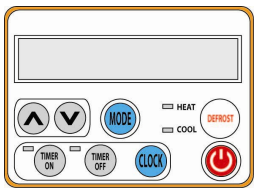
**When connect the power supply of three - phase heat pump, will display nothing on the control panel if phase was lacking or phase was disordering; at those situation heat pump is under power supply phase protection, please check if all three phase are normal.**

## *Description of the order and display panel :*

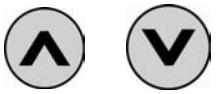
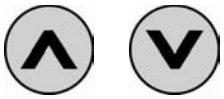



| Buttons | Function |
|---|---|
| | ON / OFF |
| | Heating mode &Cooling mode selection / Defrost Setting |
| | Light of heating mode running<br>/ Flashing when heat pump defrosting |
| | Light of cooling mode running (invalid in the heating only system) |
| | Adjustment of the temperature desired;<br>Adjustment of the start and stop hour; |
| | Adjustment of the temperature desired;<br>Adjustment of the start and stop hour; |
| | Force Defrost / Temperature display |
| | To adjust the current hour and function timetable ( set a starting hour ) |
| | To adjust the current hour and function timetable ( set a stopping hour ) |
| | To set the hour |

## *Procedure of use*

| | External appliance or button of heat pump | Display | Heat pump answer |
|---|---|---|---|
| Put the heat pump under tension | Engage the circuit breaker of the heat pump  |   | Indicate the current hour |
| Put in circulation the Heat pump into the pipes | Engage the circuit . breaker of pump of filtration  |   | Indicate the current hour |
| Start | Press the button |   | Start between 1 second and 4 minutes in the last active mode (heating or cooling) |
| Go from heating mode to cooling mode or inversely from cooling to heating | Press the button |   | Stop for 4 minutes, reverse of cycle and restart in a new mode |
| Set the wished temperature into the Heat Pump | Up and Down adjustable from 5°C to 35°C (Cooling mode)* 10°C to 35°C (Heating mode) |   | The heat pump heats or cools until the required temperature |
| Stop | Press the button |   | Immediately stop and wait |
| Switch off | Use the circuit breaker of pump of filtration  |   | Completely stop |

## Adjustment of operation timetable(timer):

| | | |
|---|---|---|
| Setting the time | If the pump is running , press to stop it. | |
| | Press on the for 5 seconds. The hour setting mode is activated, the hours light. | 21:13<br>The left-digit flash |
| | Set the hour using the  | 15:13 |
| | Press | 15:13<br>The right-digit flash |
| | Set the minutes using the  | 15:30 |
| | press once again (or wait around 10 seconds, the display will leave the setting mode by itself) | 15:30 |

| | | |
|---|---|---|
| Setting times of hours (TIMER) | Press on the twice | 21:13<br>The left-digits (hour) flash |
| | Set the hour using the | 15:13 |
| | Press to go to minutes setting | 15:13<br>The right-digits (hour) flash |
| | Set the minutes using the | 15:30 |
| | Press to confirm the setting | 15:30 |

# *Settings*

Manual defrosting:

The heat pump is set for defrosting automatically.

Under special conditions, it is possible to force defrosting by pressing the buttton

. The default force defrost time is 8 minutes. This defrosting could be stopped by pressing the button OFF.

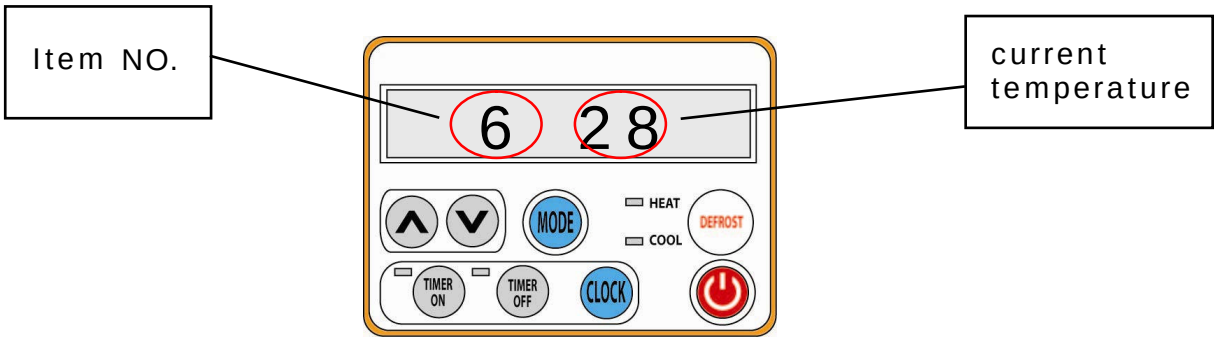
Temperature display:

Press on

for 4 seconds to enter the Temperature display.

Press on

again to enter the next item temperature display.




| Item NO. | Meanings |
|---|---|
| 6 | Temperature of the water |
| 7 | Temperature of the ambient |
| 8 | Defrost sensor temperature |
| 9 | Compressor exhaust temperature |

Defrosting setting:

Press on

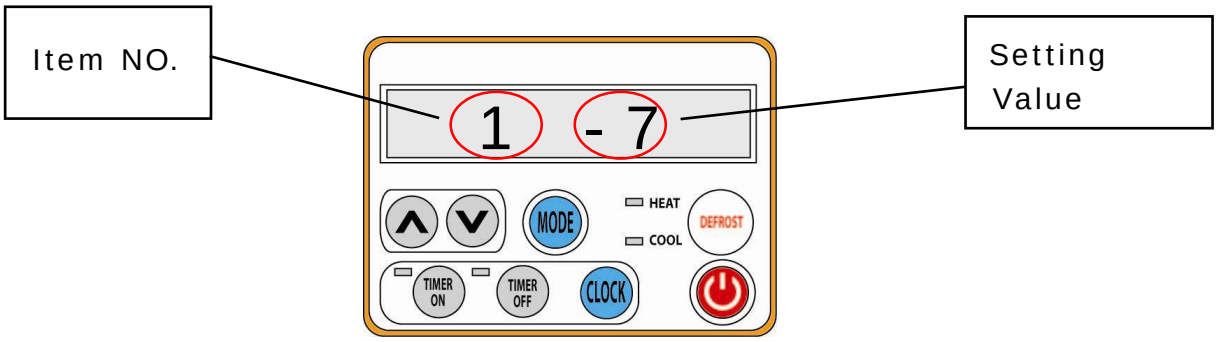
for 3 seconds to enter the Defrosting setting.

Set each parameter using and according the table below.

Press on

to enter the next Item ;

After setting the value, the defrosting setting will exit automatically after several seconds. And the system will memorize the last value of each setting.




| Parameter NO. | Meanings | Range | Default Value | Remark |
|---|---|---|---|---|
| 0 | Flow switch detection | 0 / 1 | 0 | adjustable |
| 1 | Defrost starts temperature | -30~0℃ | -7 ℃ | adjustable |
| 2 | Defrost stops temperature | 0~30 ℃ | 10℃ | adjustable |
| 3 | Interval of defrost | 30~90min | 45min | adjustable |
| 4 | Time of defrost | 1~20min | 8min | adjustable |

Detection of flow switch (0 / 1):

A) When choosing 0, the detection does not work in 10 minutes after compressor running; 10 minutes later start to detect, if it is display error code Eb, machine will be stop then.

B) When choosing 1, it starts to detect as soon as compressor start, if it is display error code Eb, machine will be stop then.

Reset Button:

when press the button for 4 seconds, and the following points will return to initial state (Windows default):

0. Flow switch detection：0
1. Defrost starts temperature: -7℃
2. Defrost stops temperature: 10℃
3. Interval of defrost : 45 minutes
4. Time of defrost : 8 minutes

## 6- Water Flow and refrigerating circuit pressure

After putting into service, do the settings of pressure of the refrigerant circuit for having an optimal operating of the heat pump, following:

Stage 1:
Access to the seal of the filling gas valve in removing the rubber cover ; before starting the Heat Pump, connect the manometer, the needle must shows before starting and to an ambient temperature around 20°C, a pressure from 14 to 16kg/cm².

Stage 2:
Close completely the by pass valve and open largely inlet and outlet valves of the Heat Pump; in these conditions the totality of the water flow goes by the Heat Pump.
Put into service the Heat Pump in heating mode, wait for the indicated pressure being stabilized; the correct setting of the pressure is from 28 to 30 kg/cm²;
In most of cases (pump of filtration given a flow until 20m3/h) you do not have to open the by pass valve.
If the stabilized pressure is under 28kg/cm², the progressive opening of the by pass valve will allow rising this pressure.

The adjustment of the by pass valve done, you have in principle no reason to modify it during the season. See the paragraph “Environment problem” too.

## 7- Defrosting

The defrosting is necessary only in heating mode.

Sequences of the defrosting:

1- Start

The defrosting is engaged if the following conditions are at the same time fulfiled:

- the compressor and the fan motor run without stopping;
- the defrosting sensor temperature lower than 3°C, and the duration of time more than 45 minutes;
- the defrosting sensor temperature goes down to -7°C(factory setting).

2- The compressor and the fan stop

3- After 10 seconds, the 4 way valve shifts

4- Five seconds after its stop, the compressor starts alone and the accumulated freeze on the gills becomes melting, what is generally with a steam cloud.

5- Stop:

The defrosting stops if one of the following conditions is fulfiled:

- the defrosting operates 20 seconds and the detected temperature by the defrost sensor goes up to 10°C(factory setting).
- the defrosting mode had run totally 8 minutes

6- The compressor stops

7- After 10 seconds the 4 way valve shifts

8- Five seconds after its stop the compressor and the fan start for restarting in heating mode.

# *8 – Environment problem*

Under certain external conditions the heat exchanges between the refrigerant and the water on one hand and between the fluid and the air on the other hand are insufficient; the consequence is that the refrigerating circuit runs up in pressure and the compressor consumes more electricity.

The temperature sensors compressor outlet and the magnetic circuit breaker on the compressor power supply protect the compressor from these extreme conditions; the error messages *E 05* or *E 06* occur.

The condition causing this situation is as follows:

In heating mode:

- insufficient water flow: close the by-pass valve for increasing the heat exchange ( refrigerant → water )

In cooling mode:

- too big water flow: open the by pass valve for decreasing the water flow and make the heat exchange ( water → refrigerant ) more electricity.
- insufficient air flow: be sure that the gills of the radiator are not blocked.

Note: these error codes are likely to occur if temperature of swimming pool water is high and the ambient air is hot.

# *9 - Regular operations of maintenance*

Washing the sand filter of your filtration installation :

Stop the Heat pump

Wintering :

Stop and put the heat pump out of tension
Stop and put the filtration pump out of tension

Entirely unscrew the 2 connections on the Heat pump and have each pipe slip to make leave the openings coming out from the heat pump ; the Heat pump gets empty, wait for the complete emptying.
(THE EXCHANGER MIGHT BURST IF IT HAS NOT EMPTIED COMPLETEY)

Put back each pipe to its place and screw again the connections to entirely close again (to avoid little animal's entry)

Remark : supplement the draining of your filtration installation or call your fitter (all your installation must be protected against the freezing)

Maintenance :

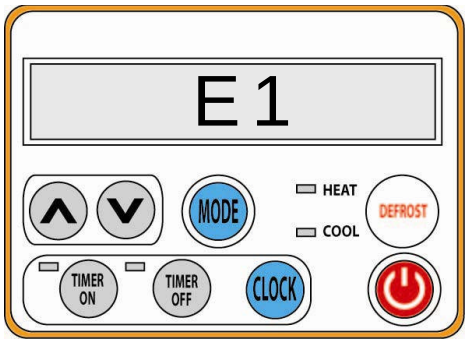
Make sure that nothing comes to block the gilds radiator, if it's necessary clean it with a soft brush (no water jet under pressure);

Make sure that the gilds are right, rectilinear, if it's necessary rectify them with a fine comb;

Make sure that the flue of the condensates is not blocked.

# *10 – Error codes and what to do:*

This table explains the error codes caused by a defective regulating component or by a security operation.




| Screen and state of the heat water pump | Component | Possible | Intervention | Second reason if the intervention is without effect |
|---|---|---|---|---|
| ***E 1*** **The heat pump continues running** | **Water temp sensor** | **Sensor disconnected, non supplied or defective** | **Check the connections, the wires, change it or replace the electronic card** | |
| ***E 2*** **The compressor stops and after the fan stops too** | **Ambient air temperature sensor** | **Sensor disconnected, non supplied or defective** | **Check the connections, the wires, change it or replace the electronic card** | |
| ***E 3*** **The heat pump continues running** | **Oultlet compressor temperature sensor** | **Sensor disconnected, non supplied or defective** | **Check the connections, the wires, change it or replace the electronic card** | |
| ***E 4*** **Compressor and fan stop** | **Defrosting system** | **The defrosting is incomplete and the automatism decides to stop the heat pump** | **Increase lightly the water flow going into the heat pump; the effect is to increase the temperature of the refrigerant in the evaporator.** | |
| ***E 5*** | **Magnetic ammeter** | **The compressor stops 3 times in 24h because of intensity excess in the compressor** | **Environment problem** | |
| ***E 6*** **Compressor and fan stop** | **Oultlet compressor temperature sensor** | **Oultlet compressor temperature detected up to 105°C more than 3 times in 24h** | **Environment problem** | |
| ***E 7*** **Compressor and fan stop** | **Magnetic circuit breaker** | **Electric current leak from the compressor, from the fan or from an electrovalve; electric safety system of the heat pump** | **Switch off the current and call an electrician for repairing or replacing the defective component** | |
| ***E b*** | **Flow switch** | **Flow switch disconnected, non supplied or defective** | **Check the connections, the wires, change it or replace the electronic card** | |
| **The compressor hums without starting and the electric supply breaks** | **Starting condenser of the compressor** | **The condenser is defective** | **Replace the condenser** | **Compressor piston clamped, call a refrigerating engineer** |
| ***E 9*** | **High pressure pressostat** | **Pressostat is disconnected, or defective** | **Call a refrigerating engineer who will do the necessary controls of the circuit pressure** | |
| ***E A*** | **Low pressure pressostat** | **Pressostat is disconnected, or defective** | **Call a refrigerating engineer who will do the necessary controls of the circuit pressure** | |

## *11 - Problems / solutions :*

The difficulties met the most often can be solved by reading the table below.
If nothing corresponds to the list, or if the solutions applied do not solve the problem, refer to **DIRECTIONS FOR INSTALLATION AND MAINTENANCE** or contact your retailer.

| Difficulty | Observation | Probable cause | Explanation / Solution |
|---|---|---|---|
| **The heat pump does not start** | **Extinct screen** | **No power** | **Check that the circuit breaker of the table is engaged in the technical room** |
| | **Extinct screen and heat pump supplied in power** | **The power supply is defective** | **Call your retailer** |
| | **Extinct screen, filtration is working** | **The in and out pipes of the heat pump are reversed or the flow switch is not sufficient** | **Check on the heat pump that the in and out pipes are not reversed. Check the filtration pump works or is not defused** |
| **Water is running below the heat pump** | **The water comes from the bottom of the heat pump** | **Drain of the condensates not installed or stopped : black, plastic conduit prolonged with a flexible pipe of evacuation** | **It's natural : these condensates are caused by condensation of the humid air on the gilds of the evaporator** |
| **The temperature of the swimming pool is increasing very slowly** | **The heat pump works** | **The rising in temperature is more or less rapid according to the volume of the swimming pool and to the climatic conditions. An isothermic cover will improve the performances in heating** | |
| **White frost or ice appears outside on the gilds of the evaporator** | **The layer of the white frost is thin** | **The outside temperature is low and the air is humid** | **See the paragrah 5 of this manuel** |
| | **The layer of the white frost is thick (the blades of the ventilator may rub on the ice much thicker inside)** | **Outside temperature very low and air very humid** | **The automatic de-icing is not sufficient ; stop the heat pump for the operations of wintering** |
| **The heat pump emits noises of vibration or sheet** | **The vibrations can be located or the heat pump is not stable** | **It's not horizontal or not well fixed ; the pipes may have moved into the pump during the transport or the installation** | **Call your retailer** |

# 12 - Further recommendations:

**Linked to the Directive of the under Pressure Equipment (PED-97/23/CE)**

1. ***Installation and Maintenance***

- Before any intervention on the machine, installation, startup, use, maintenance, the staff will have to know all of the instructions and recommendations shown into the notice of the apparatus, and the technical file of the project.
- The staff taking delivery of the apparatus, will have to control visually that the apparatus has not had any damage during the transport : refrigerating circuit, electric box, frame and carossery.
- It's prohibited to use the apparatus near :
  a. a heat source
  b. combustible materials
  c. a return air grille of air of an adjacent building
- For some apparatuses, you have to use the protective grille if it's located in a place of which the access is not ruled.
- The apparatus must be installed, started, maintained, repaired by a qualified staff, with respect to the requirements of the directives, laws, rules of the country and with respect to the rules of the profession.
- During the installation, repairing, maintenance, you are not allowed to use pipes as a footboard. The pipe could break under the weight, and the refrigerant could entail serious burns
- During the maintenance of the apparatus, you'll control the composition and the state of the coolant fluid, and that there is no trace of refrigerant.
- During the annual control of the sealing of the apparatus, with respect to the rules in force, check that the high and low pressure controllers are connected directly to the refrigerating circuit and that they cut the electric circuit in case of release.
- During the maintenance, make sure that there are no traces of corrosion or of oils around the refrigerating components.
- Before intervening on the refrigerating circuit, you have to stop the apparatus and to wait for a few minutes, before posing temperature or pressure gauges. Some equipment as the compressor and the pipes can reach temperatures superior to 100°C and high pressures can entail serious burns.

***10 Repairing***

- Any intervention on the refrigerating circuit will have to be done with respect to the code of practice and safety in force into the profession : recovery of the refrigerant, brazing under nitrogen, etc.
- Any brazing will have to be done by qualified brasors.
- For the apparatuses filled of R410a, refer to the specific instructionsinto the use notice.
- The pipes will have to replaced only by copper tube conform to the NF EN 12735-1.
- Detection of leaks, case of test under pressure :
  - Never use oxygenate or dry air, due to fire or explosion hazard
  - Use nitrogenize dehydrated or a mixture of nitrogenize and refrigerant as shown on the descriptive badge
  - The pressure of the test side low and high pressure must not exceed 20 bars and 15 bars when the apparatus is equipped with a manometer.
- As regards the pipes of the high pressure circuit, made with copper tube of a diameter equal or superior to 1'' 5/8, you'll have to request a certificate §2.1 according to the norm NF EN 1020004 to the supplier and keep the certificate into the technical file of the installation.
- Any replacement of a piece by another one, any modification of the refrigerating circuit, any replacement of the refrigerant by a fluid different from the one shown on the descriptive badge, any use of the apparatus beyond the applications shown into the documentation, would entail the cancellation of the marking CE conform to the PED, and would be placed under the responsibility of the person having done those modifications.
- The technical information concerning the requirements of safety of the differents directives applied, are shown on the descriptive badge. All of these pieces of information must be registered on the installation notice of the apparatus, which must be shown on the technical file of the installation :

- Model - code – serial number
- TS maxi and mini
- PS
- Year of manufacturing
- Marking CE
- Address of the manufacturer
- Refrigerant and weight
- Electrical parameters
- Thermodynamic and acoustic performances

**DECLARATION OF CONFORMITY**
**Heat pumps of swimming pools**
**KS120N/R KS150N/R KS200N/R KS250N/R**

***are conform to the provisions***
of the directive ELECTROMAGNETIC COMPATIBILITY 89/336/CEE

of the directive LOW PRESSURE 73/23/CEE

CE